



Amazon Web Services

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Agenda

-  AWS Intro
-  Cloud Computing
-  Case Studies
-  Security
-  Questions

Amazon's Three Businesses



Consumer (Retail)
Business



Seller
Business

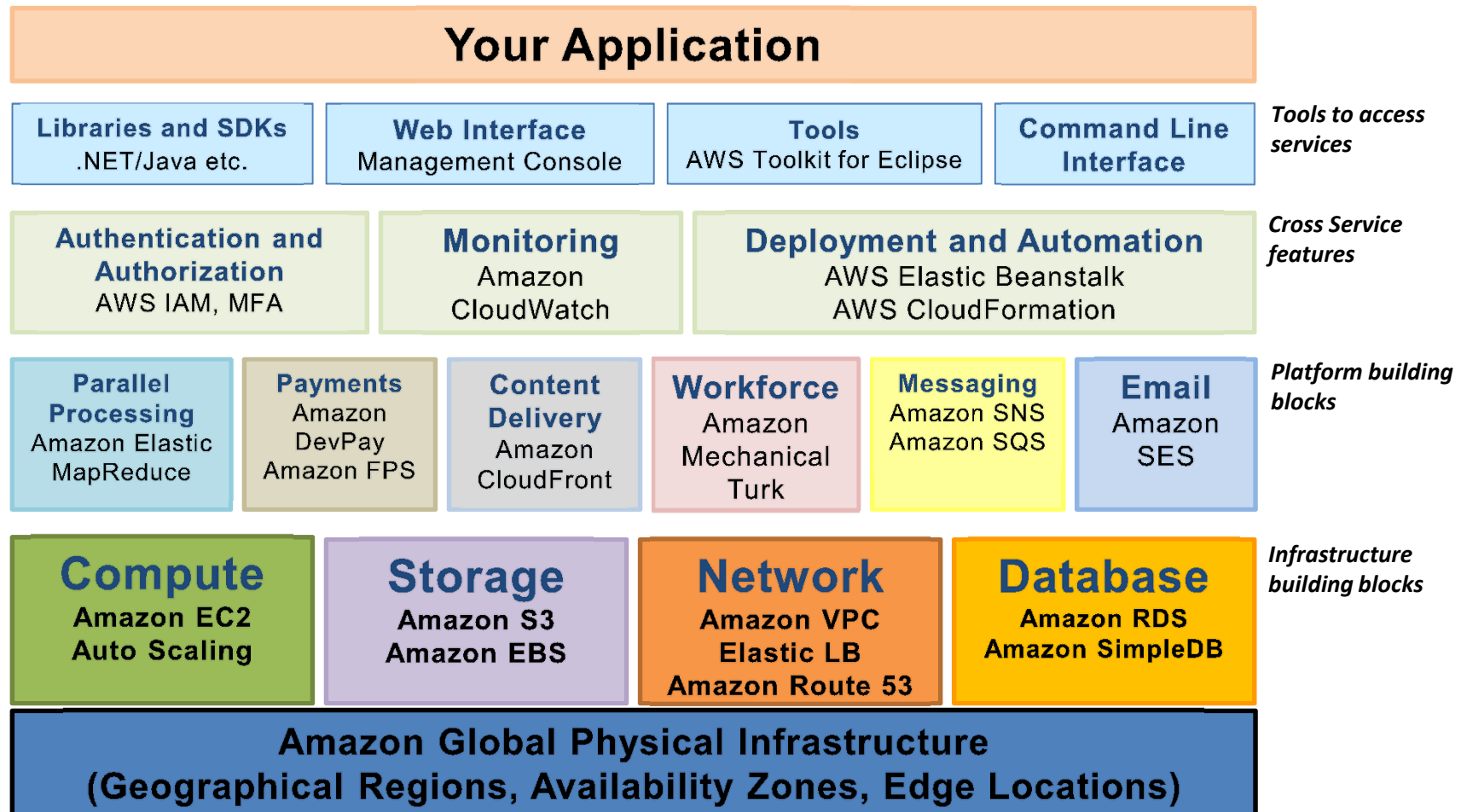


IT Infrastructure
Business

- Founded 1994
- Global technology company (NASDAQ: AMZN)
- Revenue: US\$38B
- Proven track record of innovation
- Amazon Web Services
 - Outgrowth of our Service Oriented Architecture
 - On-demand infrastructure for hosting web-scale solutions
 - AWS is now heavily leveraged by amazon.com and Fortune 1000



Amazon Web Services



On – Demand: Easy to Use

AWS Management Console x

https://console.aws.amazon.com/ec2/home?region=us-east-1#selectInstance=&launchAmi=&s=Instances

Tools: Toodledo :: Your To... Campaign: Manage ... iGoogle Google Calendar Thomson's Opportu... Thomson Weekly Le... Thomson's 2010 Go... washingtonpost.co... Google Docs - All ite...

AWS Management Console > Amazon EC2

Navigation

Region: US East (Virginia)

EC2 Dashboard

- INSTANCES
 - Instances
 - Spot Requests
 - Reserved Instances
- IMAGES
 - AMIs
 - Bundle Tasks
- ELASTIC BLOCK STORE
 - Volumes
 - Snapshots
- NETWORK & SECURITY
 - Security Groups
 - Elastic IPs
 - Placement Groups
 - Load Balancers
 - Key Pairs

My Instances

Launch Instance Instance Actions

Viewing: All Instances All Instance Types Search

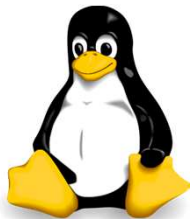
	Name	Instance	AMI ID	Root Device	Type	Status	Security Groups	Key Pair Name	Monitoring	Virtualization
<input checked="" type="checkbox"/>	empty	i-4bf7f021	ami-3ac33653	ebs	m1.small	stopped	quick-start-1	Thomson key	detailed	paravirtual
<input type="checkbox"/>	empty	i-81c7dbed	ami-c3e40daa	ebs	m1.small	stopped	quick-start-2	Thomson key	basic	hvm
<input type="checkbox"/>	empty	i-1097df70	ami-20639049	ebs	m1.small	running	DrupalDemo-EC2S		detailed	paravirtual
<input type="checkbox"/>	empty	i-76a8e016	ami-20639049	ebs	m1.small	running	DrupalDemo-EC2S		detailed	paravirtual



Customer Choice



Custom Applications



Your Application

Compute

Amazon EC2
Auto Scaling

Storage

Amazon S3
Amazon EBS

Network

Amazon VPC
Elastic LB
Amazon Route 53

Database

Amazon RDS
Amazon SimpleDB

*Infrastructure
building blocks*

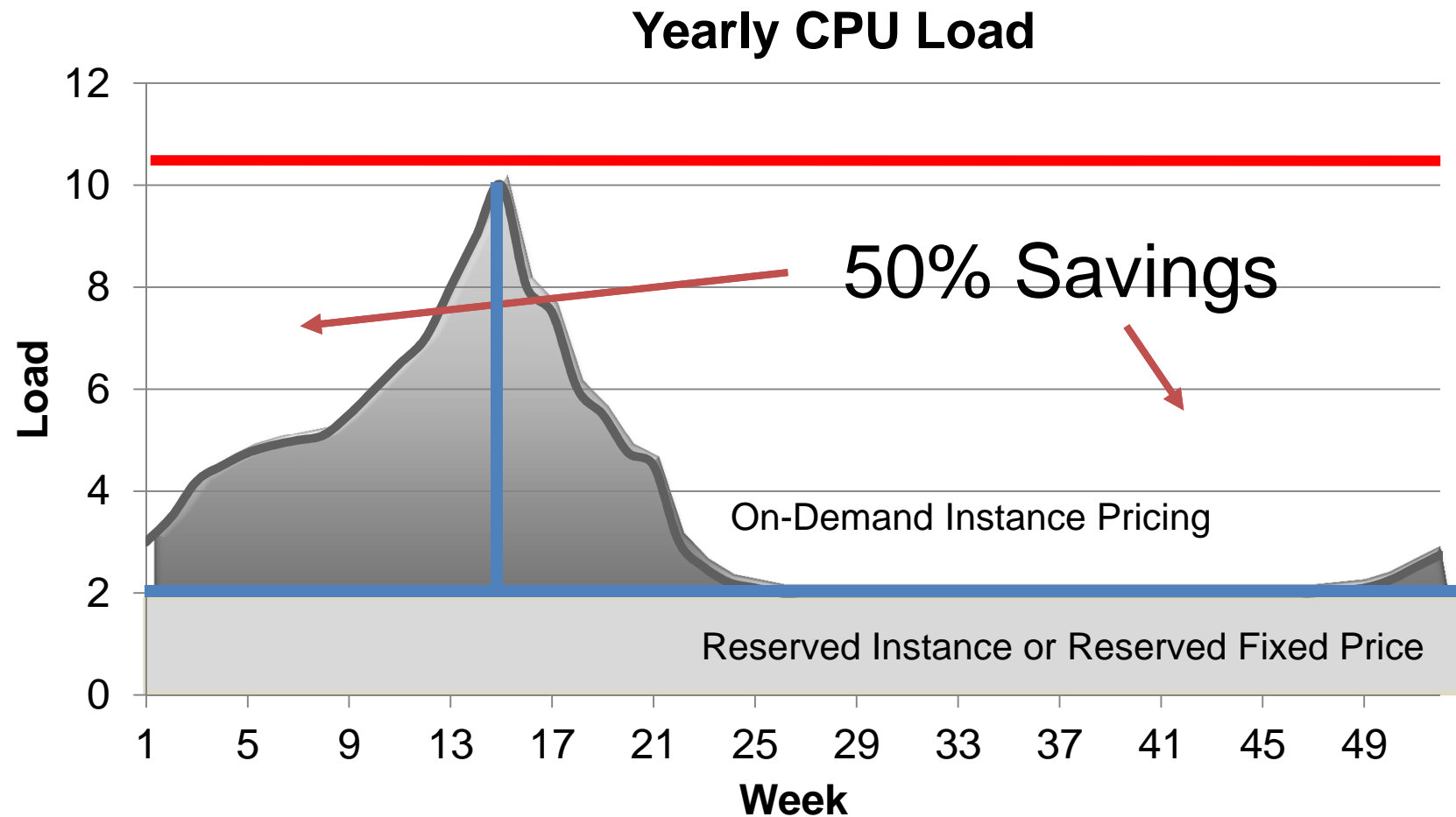
Amazon Global Physical Infrastructure
(Geographical Regions, Availability Zones, Edge Locations)



Flexible Pricing Models

- 📦 On – Demand
- 📦 Reserved Instance
- 📦 Fixed Price Reserved Instance (AWS GovCloud Only)
- 📦 Spot Instance

Elastic – Scale up and Down



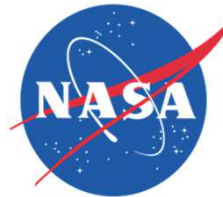
CUSTOMER USE CASES

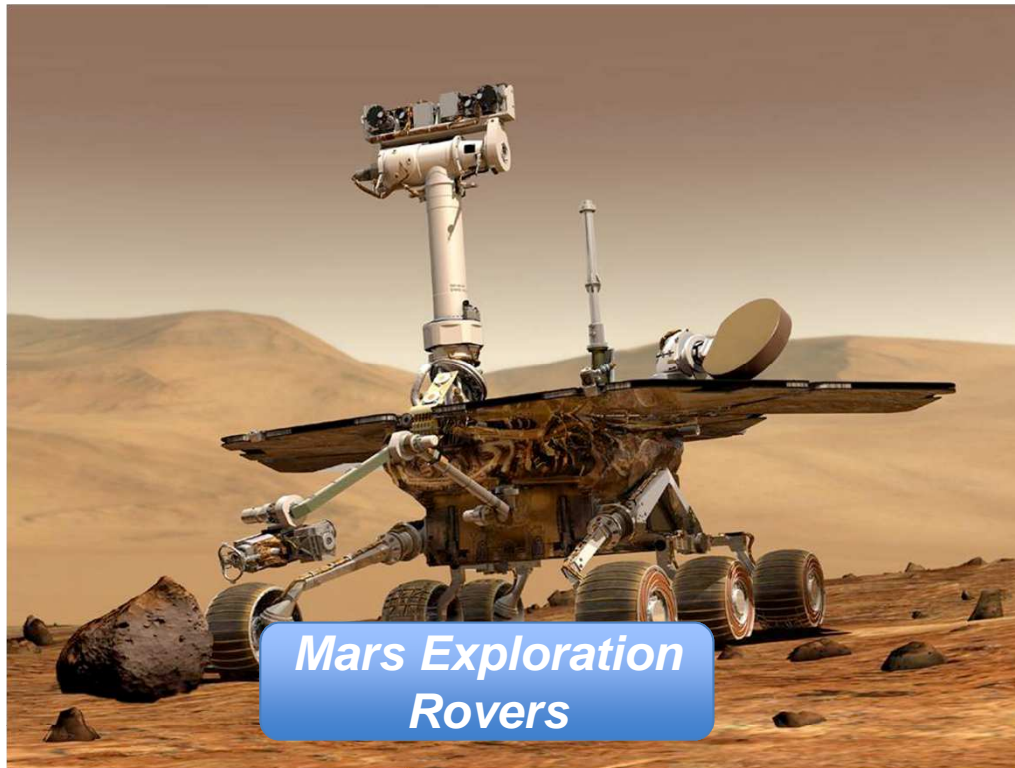




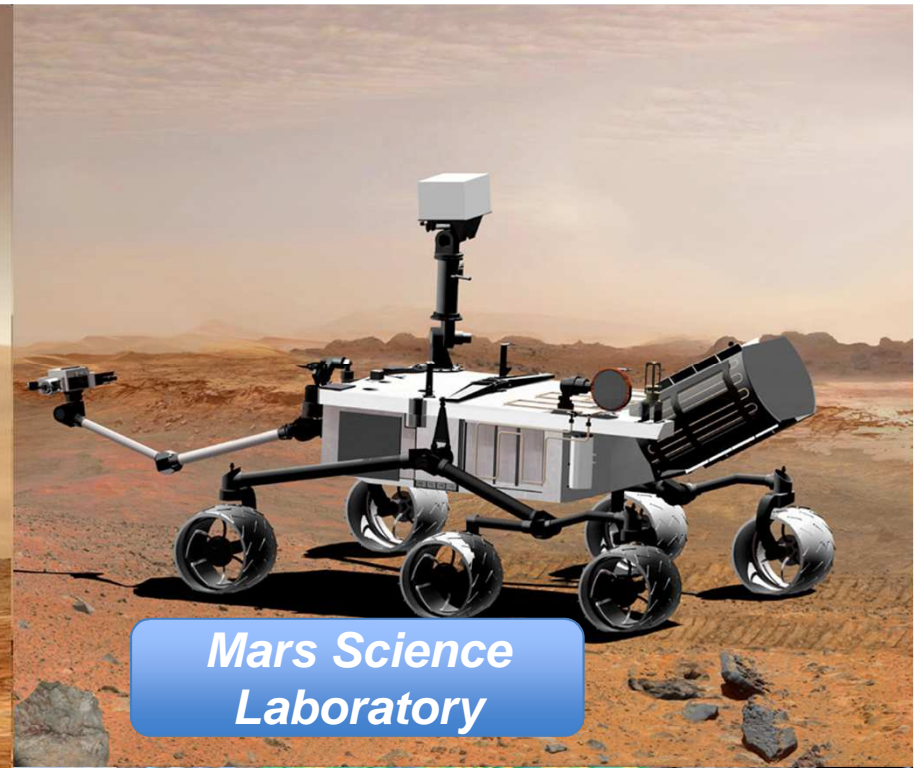
Common Use Cases

- Web site hosting
- Application hosting/SaaS hosting
- Internal IT application hosting
- Content delivery and media distribution
- High performance computing, batch data processing, and large scale analytics
- Storage, backup, and disaster recovery
- Development and test environments





**Mars Exploration
Rovers**



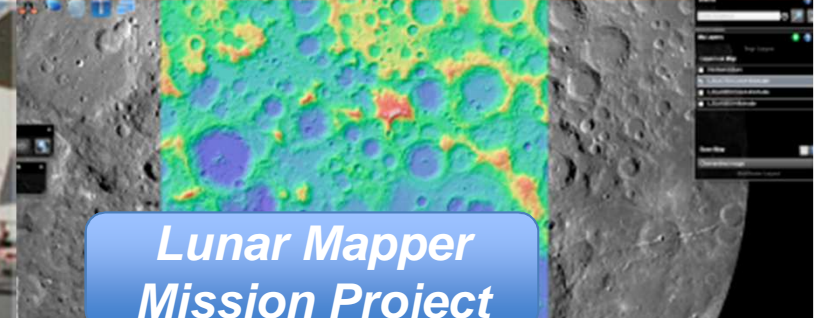
**Mars Science
Laboratory**



**Deep Space
Network**



**Carbon in the Arctic Reservoir
Vulnerability Experiment**



**Lunar Mapper
Mission Project**



**ATHLETE
Robot**



**OCO
Orbiting Carbon Observatory**

Mars Science Lab - Curiosity



Fast Motion Field Test - Image Processing in the Cloud

- Massively parallel computations on EC2

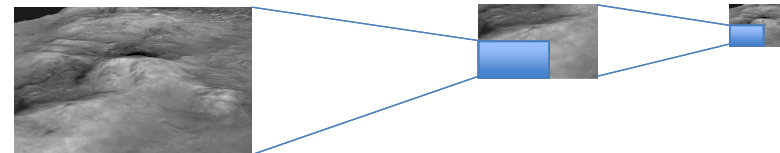
- ☐ Image Stitching (panorama generation)



- ☐ Stereo Correlation (depth perception)



- ☐ Large Image Tiling



Elasticity

- Zero to a few hundred cores, back to zero – in a few weeks

Pay-as-you-go

- Mission paid only for what it used

ESA Centre for Earth Observation

- Data collected by Satellites stored in Amazon Simple Storage Service (S3)
- Earth science data provided to organizations around the world – 50,000 users at peak, 30 TB at a time



Scalability

- Scale up storage infrastructure as much as needed

Speed and Agility

- Avoided time to procure dedicated hardware with on-demand service

Top 5 Pharma



Dynamic Molecular Modeling

- Embarrassingly Large Parallel Problem

Set up

- 30,000 cores – CentOS
- 26.7 TB RAM, 2 PB disk space
- HTTPS, SSH, 256-bit AES

Supporting Software

- Condor – High Throughput Computing Job Management
- Chef – Configuration Management; Grill – Cycle Plugin for Chef

Speed and Agility

- \$1,279 per hour. 7 hours batch job.

View: Node Show Legend Refresh

Search:

Show: All converges over the last hour

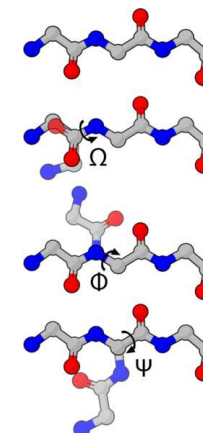
Host Name	Instance	Cluster	Status	Total Converges	Last Completed Converge	Longest Converge
ip-10-36-126-161.ec2.internal	i-33ba0c02	412	2	2	2011-07-30 15:27:42	3:55.787
ip-10-36-125-99.ec2.internal	i-931d9338	412	4	4	2011-07-30 15:36:43	3:31.503
ip-10-36-123-91.ec2.internal	i-52248441	412	4	4	2011-07-30 15:34:57	2:58.296
ip-10-36-125-137.ec2.internal	i-0889e0e1	412	3	3	2011-07-30 15:24:56	4:54.988
ip-10-35-9-95.ec2.internal	i-5436003c	412	2	2	2011-07-30 15:31:47	4:28.992
ip-10-35-3-43.ec2.internal	i-0760b066	412	4	4	2011-07-30 15:28:33	4:10.397
ip-10-35-2-10.ec2.internal	i-413c3a80	412	2	2	2011-07-30 15:21:27	3:36.483
ip-10-35-14-209.ec2.internal	i-45149204	412	3	3	2011-07-30 15:20:09	3:47.043
ip-10-35-10-207.ec2.internal	i-3739f95a	412	3	3	2011-07-30 15:27:13	4:23.522
ip-10-35-10-166.ec2.internal	i-4028a0ca	412	2	2	2011-07-30 15:34:35	3:41.924
ip-10-35-10-155.ec2.internal	i-3f109f5a	412	2	2	2011-07-30 15:26:24	4:19.735
ip-10-35-1-149.ec2.internal	i-871c9a61	412	3	3	2011-07-30 15:22:55	5:57.871
ip-10-34-235-240.ec2.internal	i-3f26a05a	412	5	5	2011-07-30 15:20:59	2:45.281
ip-10-34-230-191.ec2.internal	i-091c9a69	412	4	4	2011-07-30 15:31:50	4:17.232
ip-10-34-243-142.ec2.internal	i-79206e58	412	3	3	2011-07-30 15:37:06	3:38.462
ip-10-34-246-5.ec2.internal	i-03179102	412	3	3	2011-07-30 15:21:15	5:09.548
ip-10-34-248-146.ec2.internal	i-9320a0f4	412	3	3	2011-07-30 15:24:28	4:11.874
ip-10-34-243-38.ec2.internal	i-51199f94	412	3	3	2011-07-30 15:32:56	3:32.161
ip-10-34-243-143.ec2.internal	i-991294f8	412	4	4	2011-07-30 15:35:01	4:26.096
ip-10-34-242-155.ec2.internal	i-4723a326	412	3	3	2011-07-30 15:32:34	4:43.006
ip-10-34-241-84.ec2.internal	i-6c28a0c1	412	3	3	2011-07-30 15:27:30	3:53.089
ip-10-34-239-126.ec2.internal	i-4723a086	412	3	3	2011-07-30 15:36:31	3:31.627
ip-10-34-238-71.ec2.internal	i-911e09f0	412	2	2	2011-07-30 15:20:15	4:00.045
ip-10-34-238-123.ec2.internal	i-093a0c09	412	2	2	2011-07-30 15:30:34	4:08.872
ip-10-34-237-47.ec2.internal	i-efc3a0a0	412	2	2	2011-07-30 15:28:54	4:35.762
ip-10-33-99-48.ec2.internal	i-67c74d06	412	1	1	2011-07-30 15:27:37	4:02.292

Completed Converges

3:29 PM

3:19 PM

3:09 PM



Cluster Computing

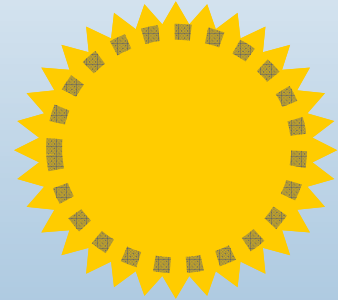
- 📦 This instance type provides low-latency, high bandwidth networking and has been optimized to support a variety of tightly-coupled and other network intensive workloads
 - CPU: 2 Intel Xeon 5570, quad core Nehalem architecture (8 compute cores)
Network: 10 Gbps ethernet
Memory: 23 GB 1333 MHz DDR3; all memory channels populated
Local storage: 1690 GB
- 📦 Graphical Processing Unit (GPU) Cluster instance
 - 22 GB memory
 - 2 x NVIDIA Tesla "Fermi" M2050 GPUs

SECURITY

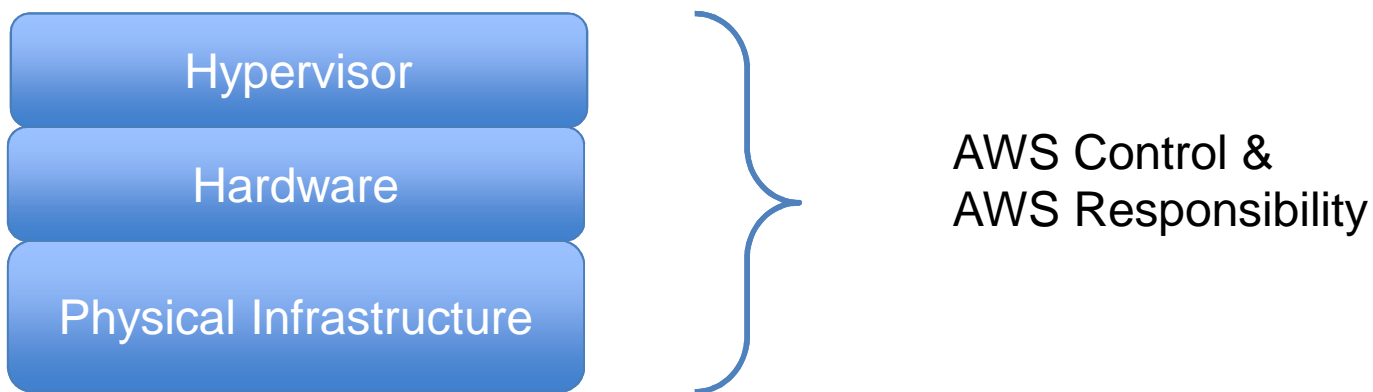
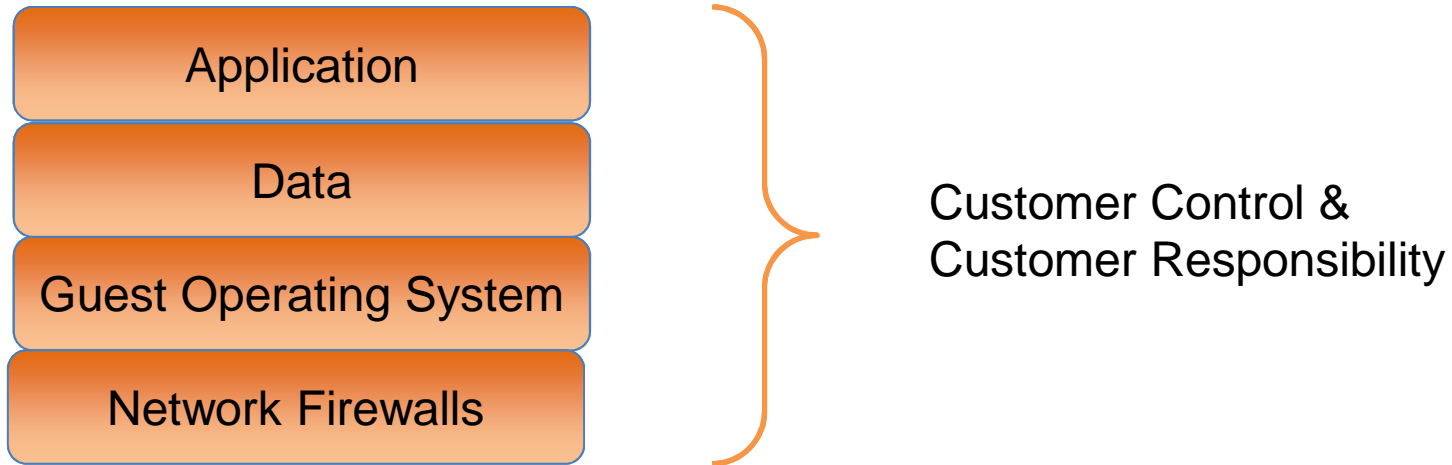


AWS Certifications

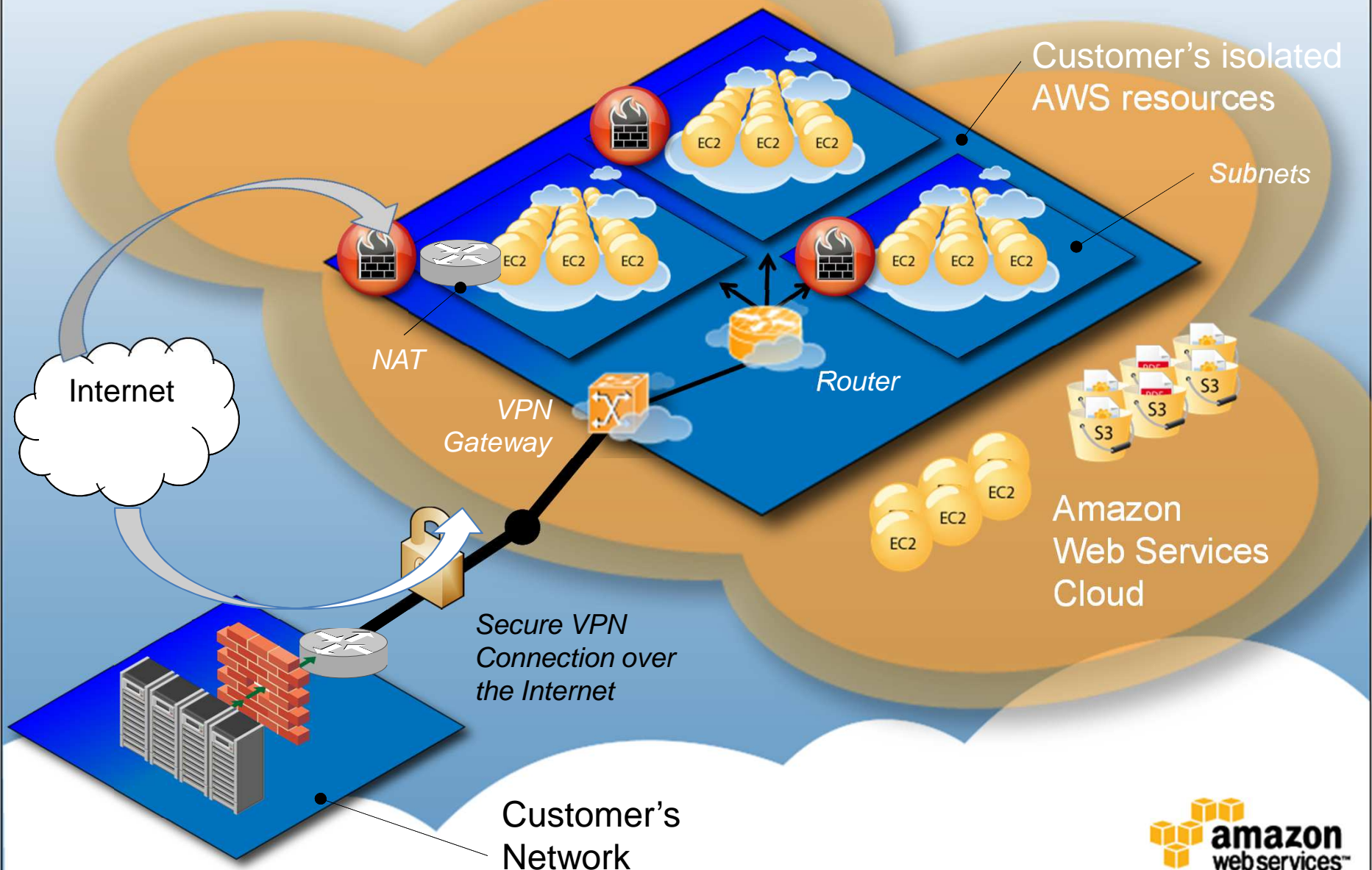
- ❏ Sarbanes-Oxley (SOX)
- ❏ SAS70 Type II Audit
- ❏ PCI Data Security Standard compliance
- ❏ FISMA Moderate A&A
- ❏ ISO 27001 Certification
- ❏ Customers have deployed various compliant applications such as HIPAA (healthcare)



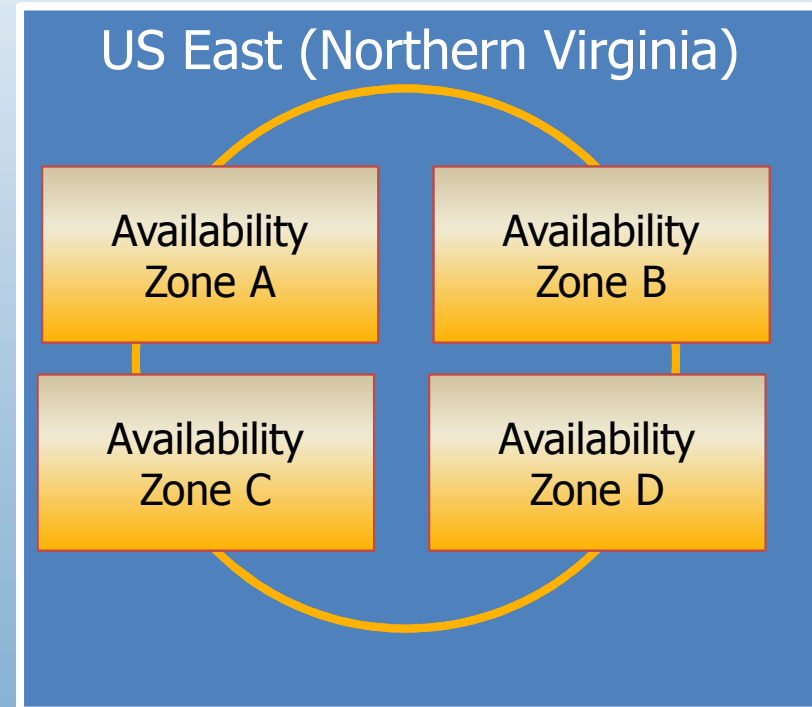
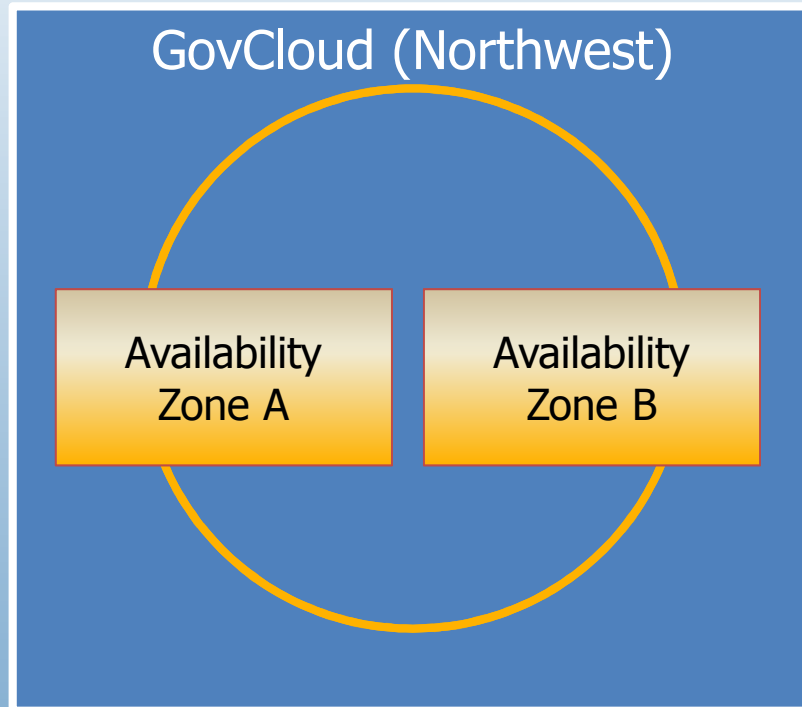
Security is a shared responsibility



Amazon VPC Architecture



Amazon EC2 Regions and Availability Zones



Amazon EC2 Regions:

GovCloud (Oregon) / US East (Northern Virginia) / US West (Northern California) / EU (Dublin) / Asia Pacific (Singapore) / Asia Pacific (Tokyo)

AWS Security Center

(<http://aws.amazon.com/security/>)

Security Whitepaper

- Answers many security & privacy questions
- Updated bi-annually
- Latest version 5/11/2011

Security Bulletins

Penetration Testing Policy

Security Best Practices

AWS Identity & Access Management (AWS IAM)

AWS Multi-Factor Authentication (AWS MFA)



Amazon Web Services: Overview of Security Processes

September 2008
(Please consult <http://aws.amazon.com> for the latest version of this paper)

Amazon Web Services (AWS) delivers a highly scalable cloud computing platform with high availability and dependability, and the flexibility to enable customers to build a wide range of applications. The issues of end-to-end security and end-to-end privacy within the cloud computing world are more sophisticated than within a single data center not facing the Internet. Ensuring the confidentiality, integrity, and availability of customer's systems and data is of the utmost importance to AWS, as is maintaining trust and confidence. This document is intended to answer customer questions such as "How does AWS help me ensure my data is secure?" Specifically, AWS physical and operational security processes are described for network and infrastructure under AWS management, as well as service-specific security implementations.



Thank You

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